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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/553,534	11/29/2005	Hubert Spreitzer	14113-00028-US	4132

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CONNOLLY BOVE LODGE & HUTZ, LLP
P O BOX 2207
WILMINGTON, DE 19899

EXAMINER	
HEINCER, LIAM J	

ART UNIT	PAPER NUMBER
1796	

MAIL DATE	DELIVERY MODE
04/14/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/553,534	SPREITZER ET AL.	
	Examiner	Art Unit	
	Liam J. Heincer	1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *January 13, 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6,8 and 9* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,8 and 9* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-6, 8, and 9 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for specific bis(halomethyl)aryleens and compounds of formula I, does not reasonably provide enablement for the broad genuses claimed. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to use the invention commensurate in scope with these claims.

The instant claims require the poly(arylenevinylene) to have a solubility of at least 0.5% by weight in an organic solvent. However, the original specification does not provide support the product of polymerization of any bis(halomethyl)arylene in the presence of any claimed compound of formula (I) to have this property. As shown in Holmes et al. (Angew. Chem. Int. Ed., 1998, 37, 403-428, supplied by applicant) most polyayrlene produce an insoluble material (pg. 404). According to Hsieh et al. (US Pat. 5,817,430), attaching soluble side chains to the polymer can affect the solubility of the final polymer, although the results are limited in the GILCH polymerization (2:33-52). As the applicant is claimed a process based on the GILCH polymerization, a person having ordinary skill in the art at the time of invention would not be able to predict which solublizing side chains would be effective. Additionally, as shown by Taylor et al. (Synthetic Metals 102 (1999) 1120-1121) the presence of bulky groups on an unsubstituted monomer would not necessarily result in a soluble product (pg. 1120-1121).

The original specification does the production of several soluble products (Table 1). However, all of these products are produced from reactants containing specific solublizing side chains (IAI-IA3 and M1-M5). As shown by Holmes et al. and Hsieh et al., a person having ordinary skill in the art at the time of invention would expect the polymers to be insoluble absent

these solublizing side chains. The prior art of record in fact indicates that the non-substituted polymers would be insoluble despite the presence of bulky groups on the monomers. As the claims encompass a much broader range of compounds than those demonstrated to give soluble products, the original specification has not shown a person having ordinary skill in the art at the time of invention how to make polymers with the claimed solubility with the claimed monomer and compound genuses.

The claims allow for an unsubtituted bis(halomethyl)arylene comonomer along with the monomer of Formula (I). As this monomer can be up to 98 mol% of the copolymer, it would substantially impact the solubility of the polymer. As set forth above, the original specification does not provide enabling disclosure for unsubstituted monomers.

Response to Arguments

Applicant's arguments filed December 16, 2009 have been fully considered but they are not persuasive, because:

A) The applicant's characterization of the R groups of Formula (I) as being "solubilizing groups" is misleading. The original specification indicates that the R groups allows for molecular weight control (6:18-29). This lower molecular weight is responsible for the increase solubility of the polymers (4:27-31). The original specification does not appear to indicate that the groups themselves affect the solubility of the polymer.

B) The applicants allegation that the polymers containing non-substituted arylene groups but substituted vinylene groups have increased solubility is not persuasive. The arguments of counsel cannot take the place of evidence in the record. *In re Schulze*, 346 F.2d 600, 602, 145 USPQ 716, 718 (CCPA 1965). See MPEP § 716.01(c). As stated in the final rejection, the prior art of record (namely Taylor et al.) indicates that non-arylene substituted polymers having substituted vinylene groups are not soluble. The applicants allegation does not overcome this evidence based on the prior art of record.

C) The applicants argument that the solubility is increased by the addition of substitutents on the vinylene group is not germane. The issue is whether a person having ordinary skill in the art at the time of invention would be enabled to make a polymer have the claimed solubility parameter based on the disclosure of the original specification. Even with an

increase in solubility, the original specification fails to allow a person having ordinary skill in the art at the time of invention to determine which polymers would be increased to the point that they would have the claimed solubility absent undue experimentation.

D) The Office agrees with the applicant that a working example is not required to establish enablement. When considering the factors relating to a determination of non-enablement, if all the other factors point toward enablement, then the absence of working examples will not by itself render the invention non-enabled. In other words, lack of working examples or lack of evidence that the claimed invention works as described should never be the sole reason for rejecting the claimed invention on the grounds of lack of enablement. A single working example in the specification for a claimed invention is enough to preclude a rejection which states that nothing is enabled since at least that embodiment would be enabled. However, a rejection stating that enablement is limited to a particular scope may be appropriate. See MPEP § 2164.02. The instant rejection is a rejection stating that enablement is limited to a particular scope.

For a claimed genus, representative examples together with a statement applicable to the genus as a whole will ordinarily be sufficient if one skilled in the art (in view of level of skill, state of the art and the information in the specification) would expect the claimed genus could be used in that manner without undue experimentation. Proof of enablement will be required for other members of the claimed genus only where adequate reasons are advanced by the examiner to establish that a person skilled in the art could not use the genus as a whole without undue experimentation. See MPEP § 2164.02. As stated by the applicant "relavant considerations are the nature of the invention, the state of the prior art, and the relative skill of those in the art". In re Stephens, Benvau, and Benvau, 188 USPQ 659 (C.C.P.A. 1976). These issues were addressed in the final rejection. As shown by the state of the prior art, absent solubilizing groups on the arylene group, polyphenylene vinylene polymers are insoluble. Additionally, in GILCH polymerization, the presence of solubilizing groups is unpredictable in producing soluble products (final rejection, pages 2-3). Given the teaching in the prior art of insolubility of unsubstituted polymers and the unpredictability of the solubilizing side chains in GILCH polymerization, a person having ordinary skill in the art at the time of invention would not

expect that the claimed genus could be made in the same manner as the species used in the working examples without undue experimentation.

Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Liam J. Heincer whose telephone number is 571-270-3297. The examiner can normally be reached on Monday thru Friday 7:30 to 5:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Eashoo can be reached on 571-272-1197. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Mark Eashoo/
Supervisory Patent Examiner, Art Unit 1796

LJH
March 18, 2010